UNREINFORCED MASONRY CHURCHES IN NEW ZEALAND
TOWARDS A HOLISTIC FRAMEWORK FOR THE IDENTIFICATION OF OPTIMAL SEISMIC RETROFIT INTERVENTIONS

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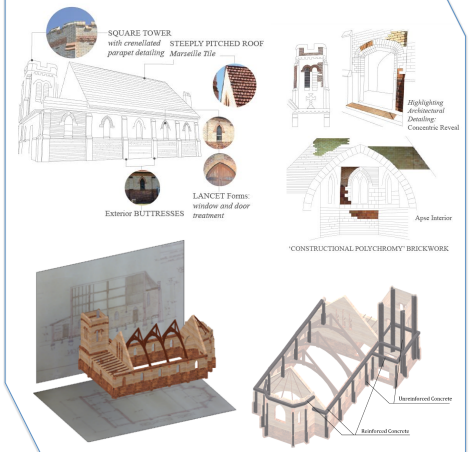
Operational Framework

1. Knowledge
2. Vulnerability Assessment
3. Design of Retrofitting Intervention/s
4. Heritage Conservation Analysis
5. Social & Cultural Value Assessment

Knowledge Phase



Social & Cultural Value Assessment

Conservation of a place should be based on an understanding and appreciation of all aspects of its cultural heritage value, both tangible and intangible (ICOMOS)

In the proposed framework, "*Social Value*" and "*Cultural Value"* are included as additional criteria for selecting, among interventions with equal seismic protection levels, the ones that respect *conservation* (e.g. structural authenticity, non-intrusiveness, non-obtrusiveness, etc.) although this might not be the best choice from an economic point of view.

Acknowledgements

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Unreinforced masonry churches in New Zealand, similarly to everywhere else in the word have proven to be **highly vulnerable to earthquakes**, because of their particular construction features.
The Canterbury (New Zealand) earthquake sequence, 2010-2011 caused an invaluable loss of local architectural heritage and of churches, as regrettably, some of them were demolished instead of being repaired.

It is **critical for New Zealand to advance** the **data collection, research and understanding pertaining to the seismic performance and protection of church buildings**, with the aim to:

promote conservation of churches and of church precincts,
assure public safety within churches
promote community wellbeing, as churches arecritical social hubs

Towards that **this project** aims to **define an holistic approach** for

✓ **assessing the seismic vulnerability of unreinforced masonry churches**; and

✓ **identifying retrofitting innervations**

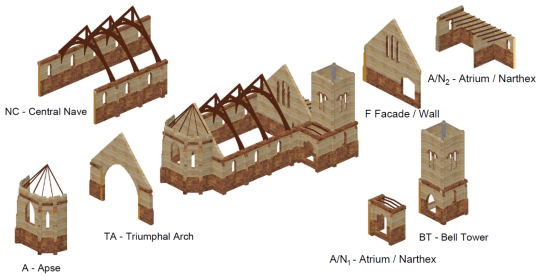
- ***effective from a seismic engineering point*** of view and
- ***conceived with respect to the conservation philosophy*** and best practices by *ICOMOS, International Council on Monuments and Sites, New Zealand Charter*.

Geographical distribution of URM churches in NZ

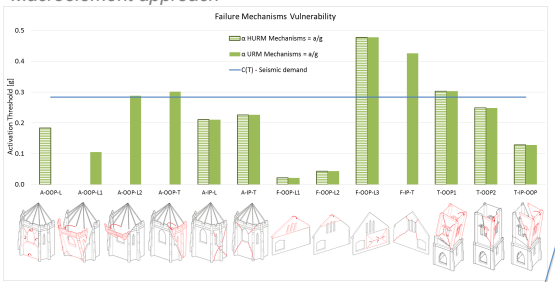
Case study Anglican Diocese of Waikato and Taranaki

Saint Paul´s Church
55 William Street,
Huntly Waikato

Vulnerability Assessment

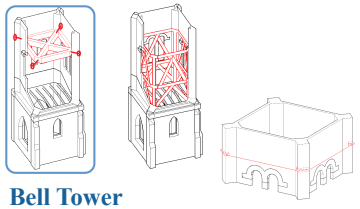


Macroelement approach

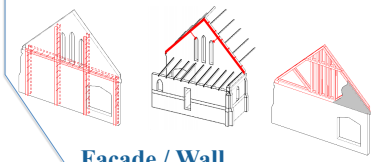


Design of the retrofitting interventions *and* Heritage Analysis

Apse



Bell Tower



Façade / Wall

ICOMOS New Zealand Charter
some of the Principles

- Respect for Surviving Evidence and Knowledge
- Minimum Intervention
- Physical Investigation
- Use - *where the use of a place is integral to its cultural heritage value, that use* ***should be retained***.
- Fixtures, Fittings and, Contents - *that are integral to the cultural heritage value of a place should be* ***retained and conserved with the place***.
- Degrees of Interventions for conservation purposes

(i) preservation, through stabilisation, maintenance, or repair;
(ii) restoration, through reassembly, reinstatement, or removal;
(iii) reconstruction; and
(iv) adaptation.

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